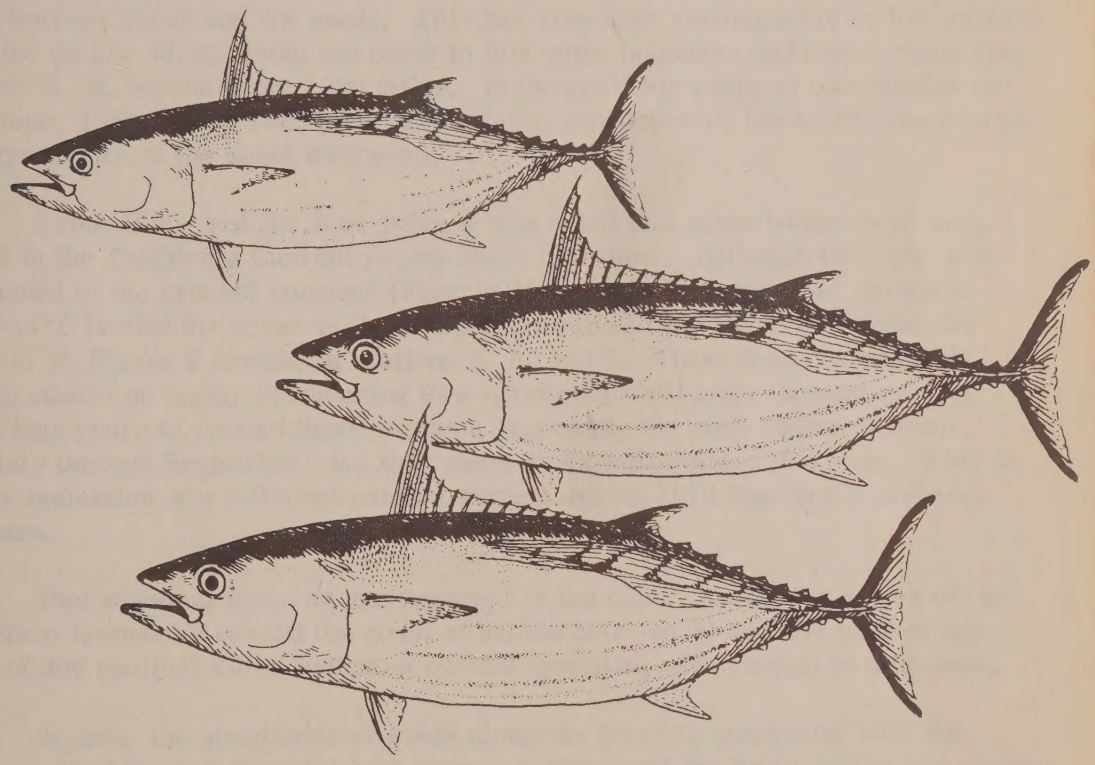
JULY-1972,-No.-7

FISHING INFORMATION

UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



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SUBSURFACE TEMPERATURE STRUCTURE IN THE NORTHEAST PACIFIC OCEAN

The most noticeable feature of the subsurface temperature structure (Figures 1 and 2) throughout this spring and early summer has been the persistence of a sharp horizontal change in a zone about 700-800 nautical miles from the California Coast. For example, in Figure 2, the 15°C isotherm deepens by 80 meters between stations 8 and 9 and the 10°C isotherm deepens by 135 meters. This structure which is apparent to a depth of 500 meters indicates a filament of current normal to the section (southeastward component) at the outer boundary of the California Current region, which is stronger than appears in the rest of the region between there and the coast. This has also been accompanied by low surface salinities (below 33.8‰) from the coast to this outer boundary and then a rapid rise to above 35.0‰ beyond about 1000 miles. In the previous years of our regular observations, 1967-70, no such zone of sharp contrast existed, but rather the changes were gradual from the coast westward.

From Plate 2 of the June issue it was noted that some eddies may have formed in the California Current region about mid-June. Although they are less pronounced in the present sections (Figures 1 and 2), the troughs and crests in the 9°-14°C isotherms occur in the same locations as they did in mid-June; for example, in Figure 2 troughs at stations 3, 5, and 7. These features probably indicate eddies or highly meandering flow within the California Current region. In previous years of record there seems a propensity for such eddies to occur from July through September, but they seem more well defined this year. This is another indication of a different current regime during 1972 than in the previous few years.

Two seasonal features are apparent in the data. First, the ascent of the subsurface isotherms toward the coast at depths between 50 and 200 meters and inside of 200 nautical miles indicates coastal upwelling which began in mid-June.

Second, the steadiness of winds along the track is increasing with the development of the sub-tropical high pressure area, and the layer depths are closely related to the wind speeds. The winds along the route during the period June 24-28 were from 14 to 23 knots and led to well-mixed surface layers of depths fairly consistently between 30 and 45 meters (Figure 1). During the period of July 8-12 the winds were only 8-10 knots from 200 miles offshore to about 140°W (900 miles) and around 15 knots west of 140°W. This led to a double-layer effect which was most pronounced out to about 900 miles. In this region the surface mixed layer was less than 20 meters (Figure 2), below which there was a change exceeding 0.5°C in the transient thermocline. Beyond 1000 miles there were weak transient thermoclines or gradients in the surface layer with temperature changes of about 0.2°C and less.

Northeastern Pacific

Deviations from the normal summer heating regime altered the pattern of anomalous temperatures in July 1972 from that of June, but conditions remained generally similar to the long-term mean. In particular, surface warming was less than normal in the area east of Hawaii allowing negative deviations to spread northward to about 30°N (Fig. 7). Below-normal warming also occurred south of the Aleutian Islands between 35°N and 45°N causing a change from positive to negative deviations from the long-term mean. The opposite effect occurred in the adjacent area between the 140th and 160th west meridians, where excess warming of surface layers caused the positive deviations to spread northward.

In a 200-mile coastal zone from Vancouver Island to Baja California, below-normal surface temperatures were maintained by strong north-northwesterly winds in the first half of July. This condition was modified by a relaxation of the winds in the latter half of the month which allowed temperatures to increase and to raise the month's average to above normal in most of the coastal zone south of Cape Blanco.

The differences in coastal winds between the first and last halves of July reflect two principal modes of the atmospheric pressure distribution. During July 4-13, the axis of high pressure in the eastern Pacific was oriented east-west between latitudes 30°N and 35°N with strong gradients along the California and Oregon coasts. From July 14 to about July 26, this axis rotated to a northeast-southwest orientation and the center of high pressure shifted north. Maximum values exceeded 1040 millibars at about 50°N, 150°W on July 20. During this time, pressure gradients south of 40°N, offshore from the California coast were much weaker than in the earlier period.

The average pressure and atmospheric circulation for the month, representing the weighted contributions of all of the individual modes, are very close to the respective long-term means in the region south of latitude 40°N and only slightly increased in the region north of 40°N (Figs. 3 and 4). Short-term changes in the distribution of sea surface temperature deviations took place in response to the frictional stresses and heat exchange processes associated with these circulation modes, but the summing up over the entire month yields only minor differences from normal conditions.

Eastern Tropical Pacific

For 3 consecutive months there has been no tendency for development of the cold tongue of sea surface temperature that, at this season, usually marks the northwestward extension of the Peru current. The failure of surface temperatures around

the Galapagos Islands and westward along the equator to follow a seasonal decline has brought on a warmer-than-normal condition in the surface waters which has spread and intensified progressively since May. Positive deviations now prevail over most of the eastern tropical Pacific except in an area north of 10°N and east of Hawaii to 135°W and in the vicinity of the Revilla Gigedo Islands. The magnitude of positive deviations exceeded 8°F in several areas on and near the equator from 100°W to the coast of South America.

The anomalous trend of equatorial temperatures is most likely associated with the disruption of the normal regime of high atmospheric pressure by a succession of mid-latitude low pressure troughs penetrating into the tropics of the southern hemisphere. This has caused a reduction in surface pressure over a large portion of the eastern south Pacific. Consequently, southerly winds along the coast of South America, north of 15°S and across the equator, were weaker than normal. Satellite data revealed a significant reduction in low-level stratus along the coasts of Ecuador and northern Peru.

Tropical storm activity north of the equator was below normal this month due to weakening of the inter-tropical convergence zone. Vigorous convergence in the ITCZ depends in part on strong southerly flow across the equator, which also enhances equatorial upwelling. In July all of these phenomenon were particularly weak.

Staff, Fishery-Oceanography Investigations
R. Michael Laurs, Leader

SEA SURFACE TEMPERATURE CHARTS, PACIFIC OCEAN
JULY 1972

Acknowledgements

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National Marine Fisheries Service, La Jolla, California; Honolulu, Hawaii; Seattle, Washington
National Weather Service, San Diego, California
National Ocean Survey, Pacific Marine Center, Seattle, Washington
Pacific Environment Institute, Fisheries Research Board of Canada West Vancouver, British Columbia, by H. J. Hollister from observations by S. G. Westhaver at Langara Island Light; J. Godin at Cape St. James Light; L. Collins at Kains Island Lightstation; O. A. Edwards at Amphitrite Point Light
Scripps Institution of Oceanography, La Jolla, California, by Margaret Robinson
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Expendable bathythermograph observations are made by the Mates of the S. S. Hawaiian Enterprise of Matson Navigation Co., and processed with assistance from the NMFS Pacific Environmental Group, Monterey: Project partially supported by National Science Foundation Grant AG-256.

Charts

Figure 1. --Surface temperature and salinity and subsurface temperature structure from expendable bathythermograph observations between San Francisco and Honolulu: June 24-28, 1972.

Figure 2. --Surface temperature and salinity and subsurface temperature structure from expendable bathythermograph observations between San Francisco and Honolulu: July 8-12, 1972.

Figure 3. --Twelve-year mean (1961-1972) observed sea level values of barometric pressure (millibars), resultant wind direction (degrees true), resultant wind speed (knots) and average wind speed (knots) regardless of direction.

Figure 4. --Observed sea level values of barometric pressure (millibars) resultant wind direction (degrees true), resultant wind speed (knots) and average wind speed (knots) regardless of direction.

Figure 5. --Mean sea surface temperature, eastern North Pacific Ocean. Squares show temperatures at weather ship stations. Numerals on shore are temperatures at coastal and lightship stations.

Figure 6. --Mean sea surface temperature chart, western North Pacific Ocean.

Figure 7. --Deviation of sea surface temperatures, eastern North Pacific Ocean from long-term charts of H.O. 225. Hatched areas are colder in 1972.

Figure 8. --Deviation of sea surface temperatures, eastern North Pacific Ocean from those of July 1971. Hatched areas are colder in 1972.

Figure 9. --Mean sea surface temperature, eastern tropical Pacific Ocean. Numerals on shore are temperatures at coastal stations.

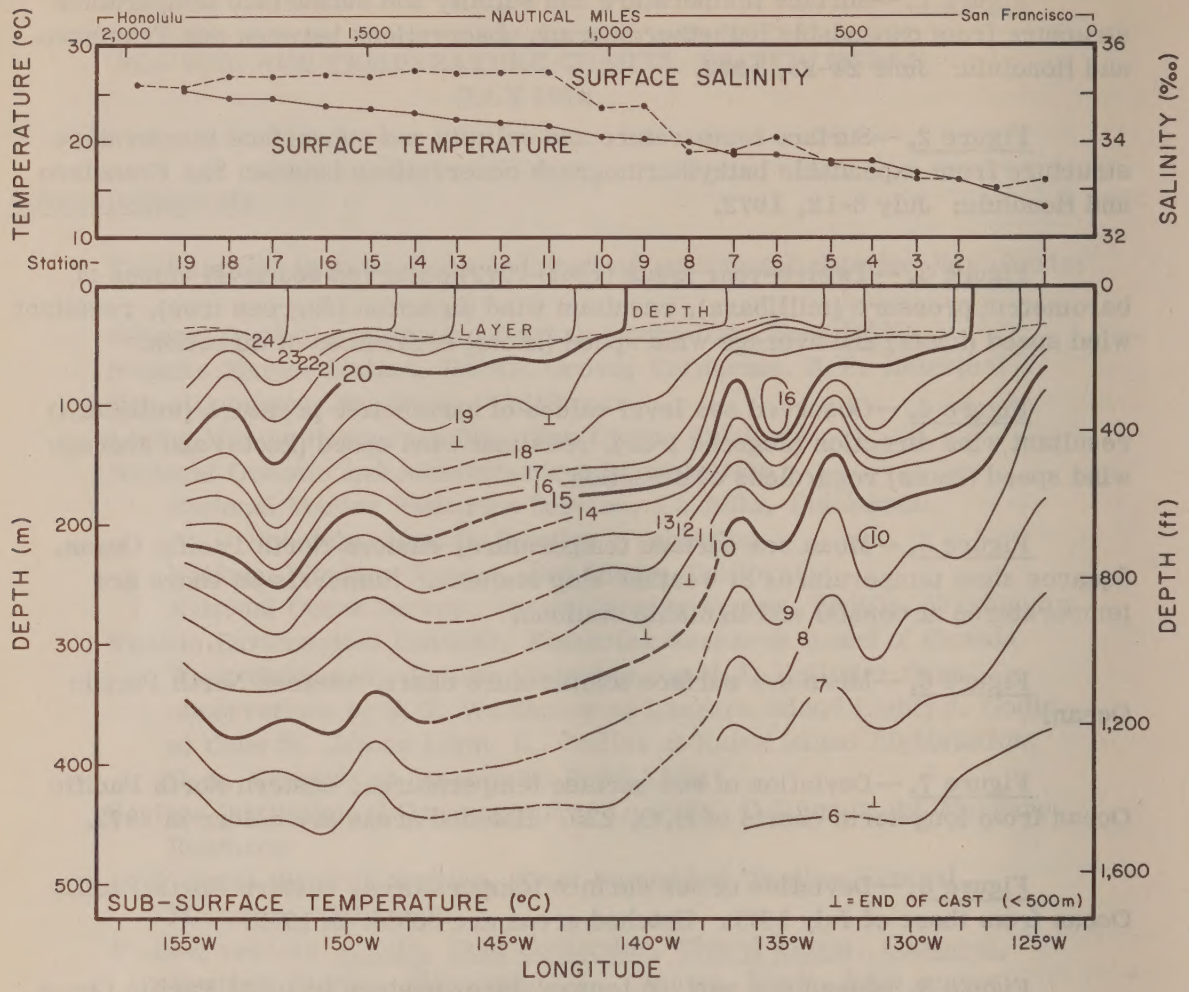
Figure 10. --Deviation of sea surface temperatures, eastern tropical Pacific Ocean from long-term charts of H.O. 225 and NAVOCEANO sp-123. Shaded areas are colder in 1972. Contours are dashed in sparse data areas.

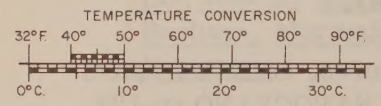
Figure 11. --Deviation of sea surface temperatures, eastern tropical Pacific Ocean from those of July 1971. Shaded areas are colder in 1972. Contours are dashed in sparse data areas.

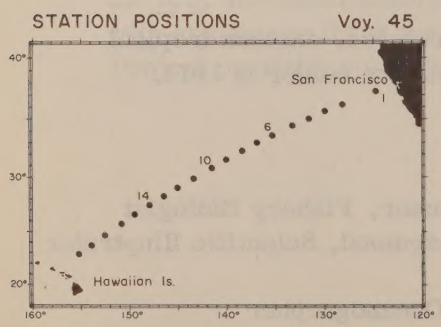
James A. Renner, Fishery Biologist
Kenneth S. Raymond, Scientific Illustrator
and
L.E. Eber, Oceanographer
Forrest R. Miller, Meteorologist
J.F.T. Saur, Oceanographer
August 8, 1972

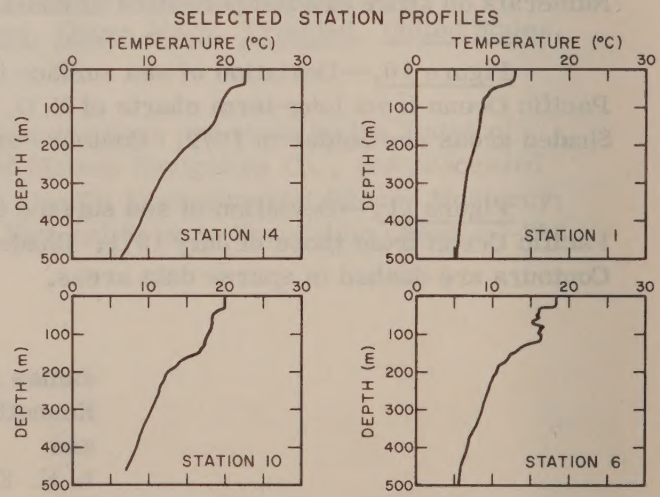
JUNE 24-28, 1972
SS HAWAIIAN ENTERPRISE, Voyage 45

FIGURE 1.



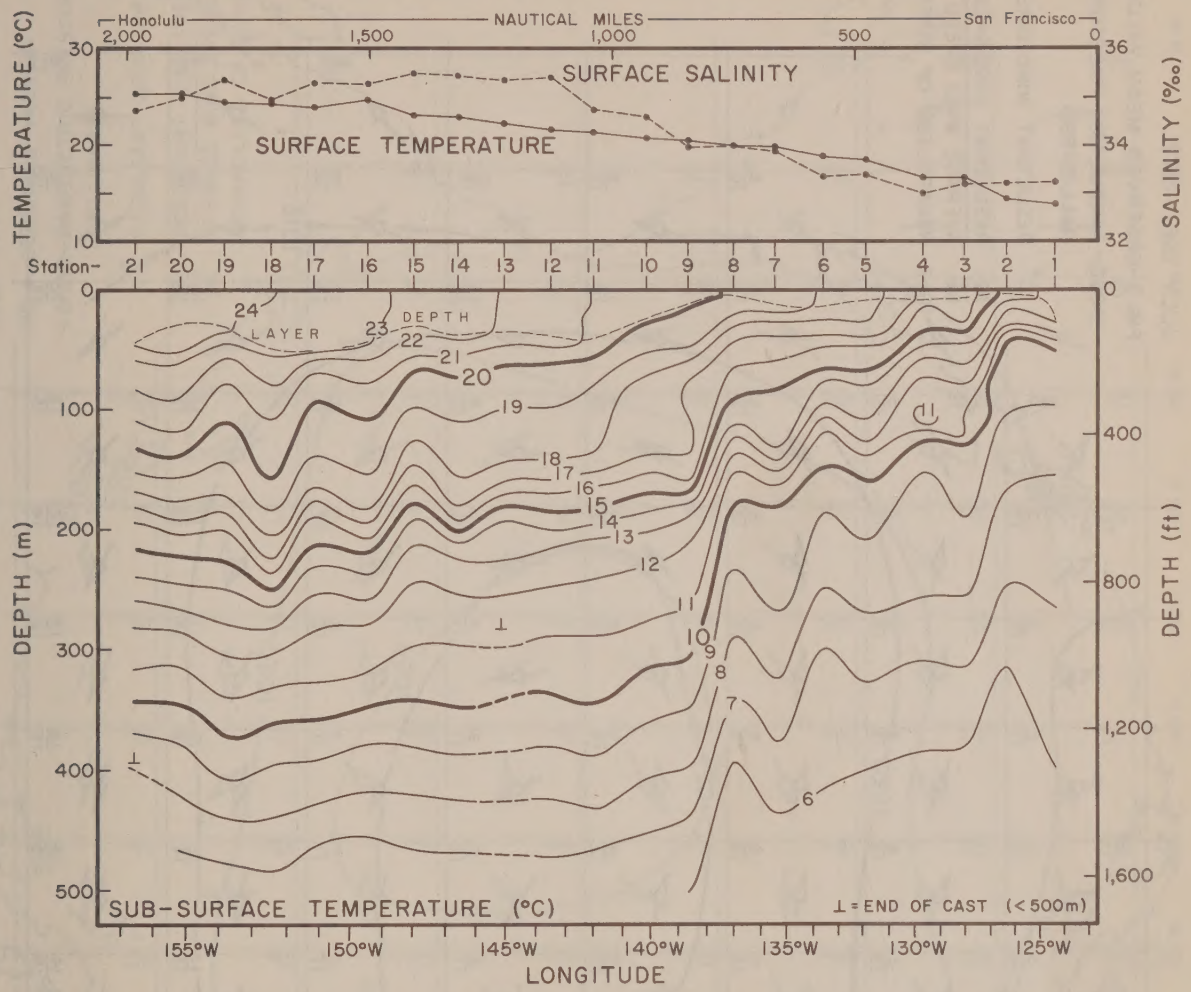


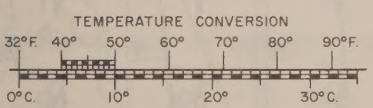




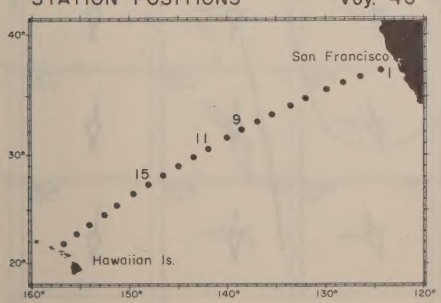
JULY 8-12, 1972
SS HAWAIIAN ENTERPRISE, Voyage 46

FIGURE 2.

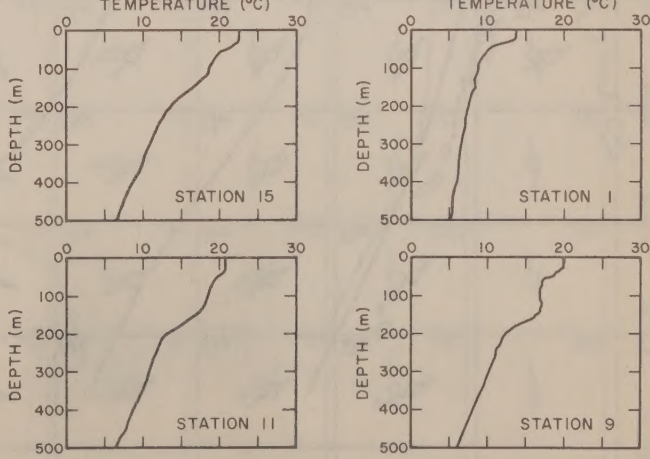


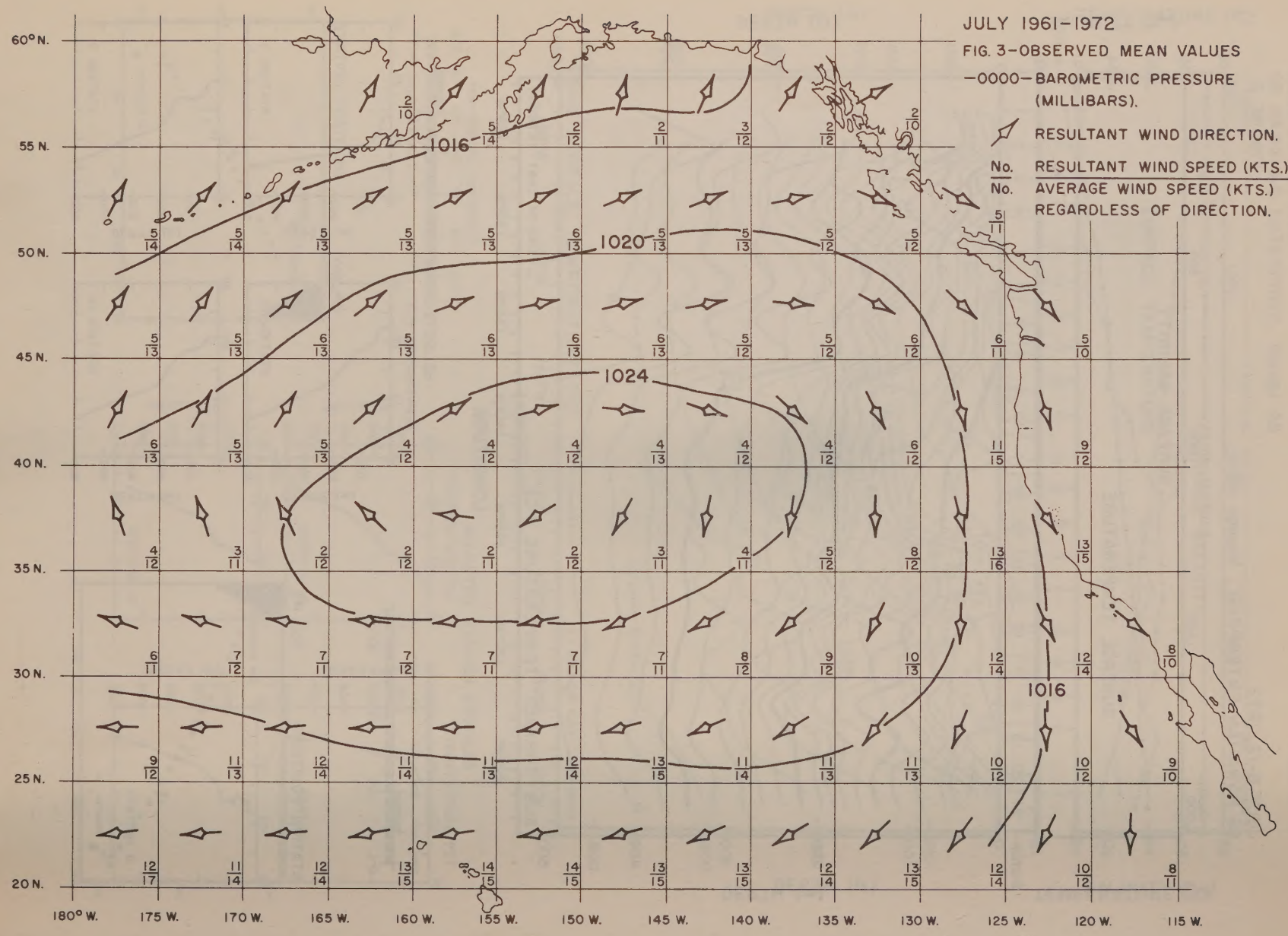


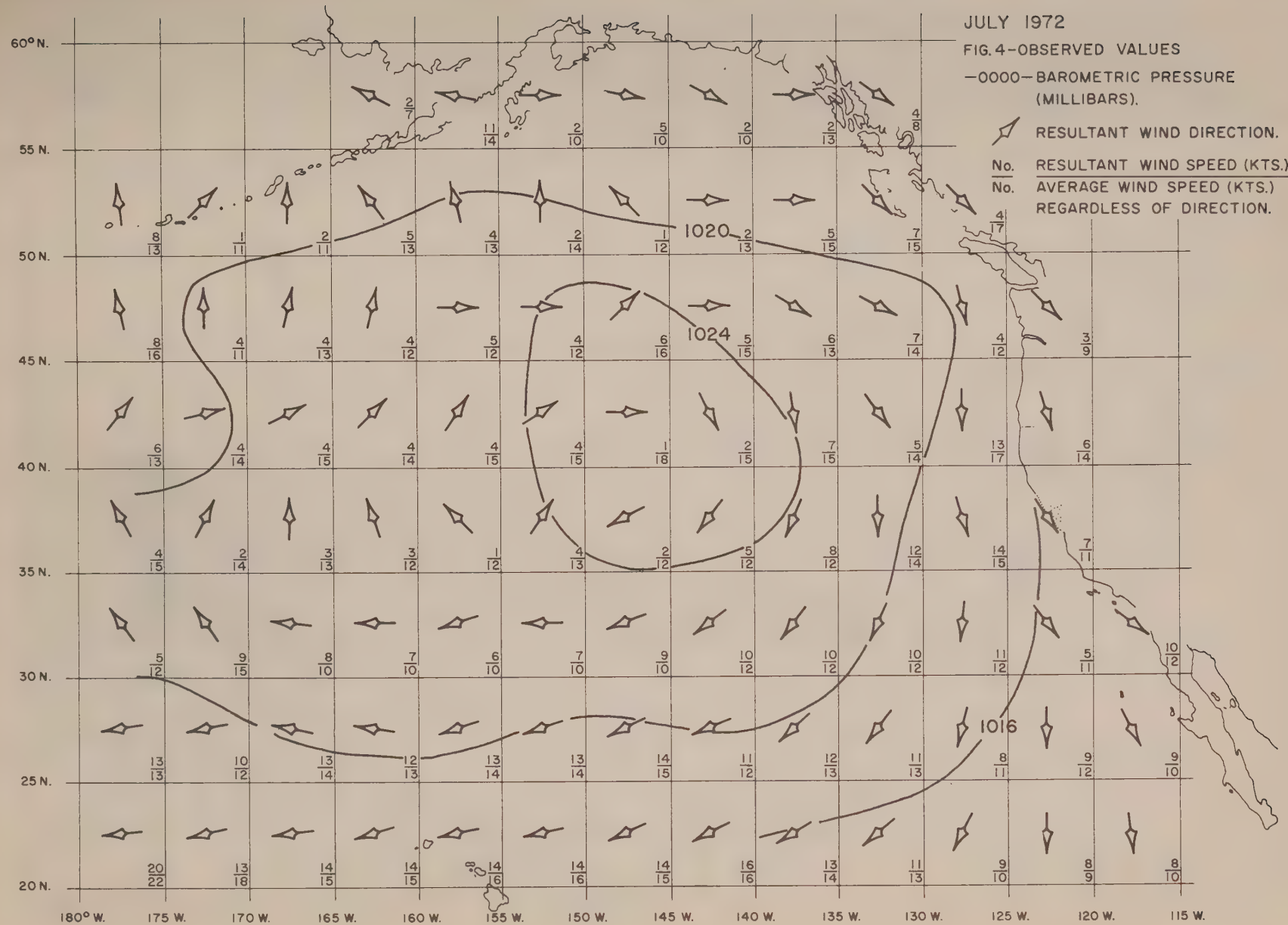
STATION POSITIONS Voy. 46

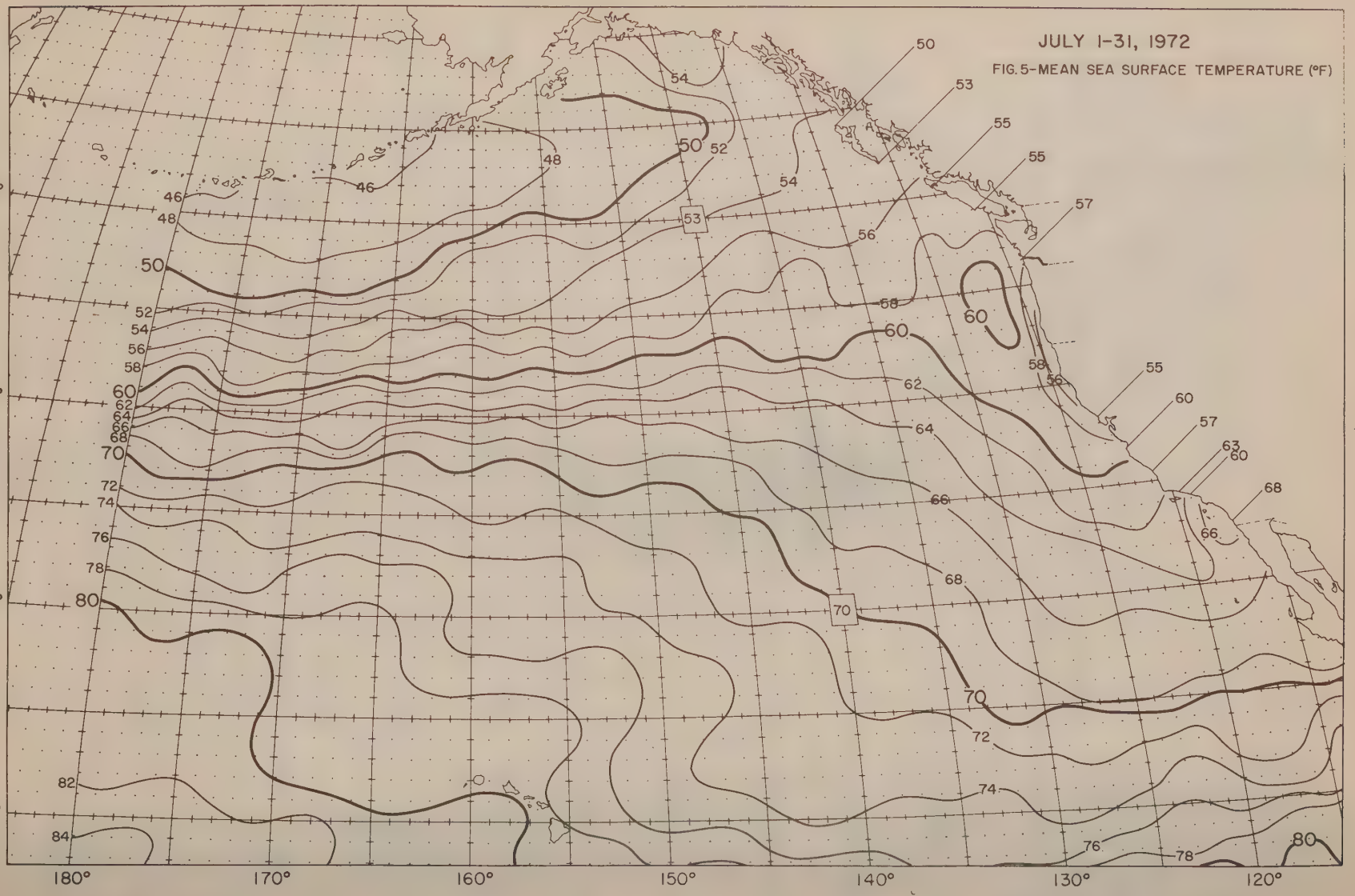


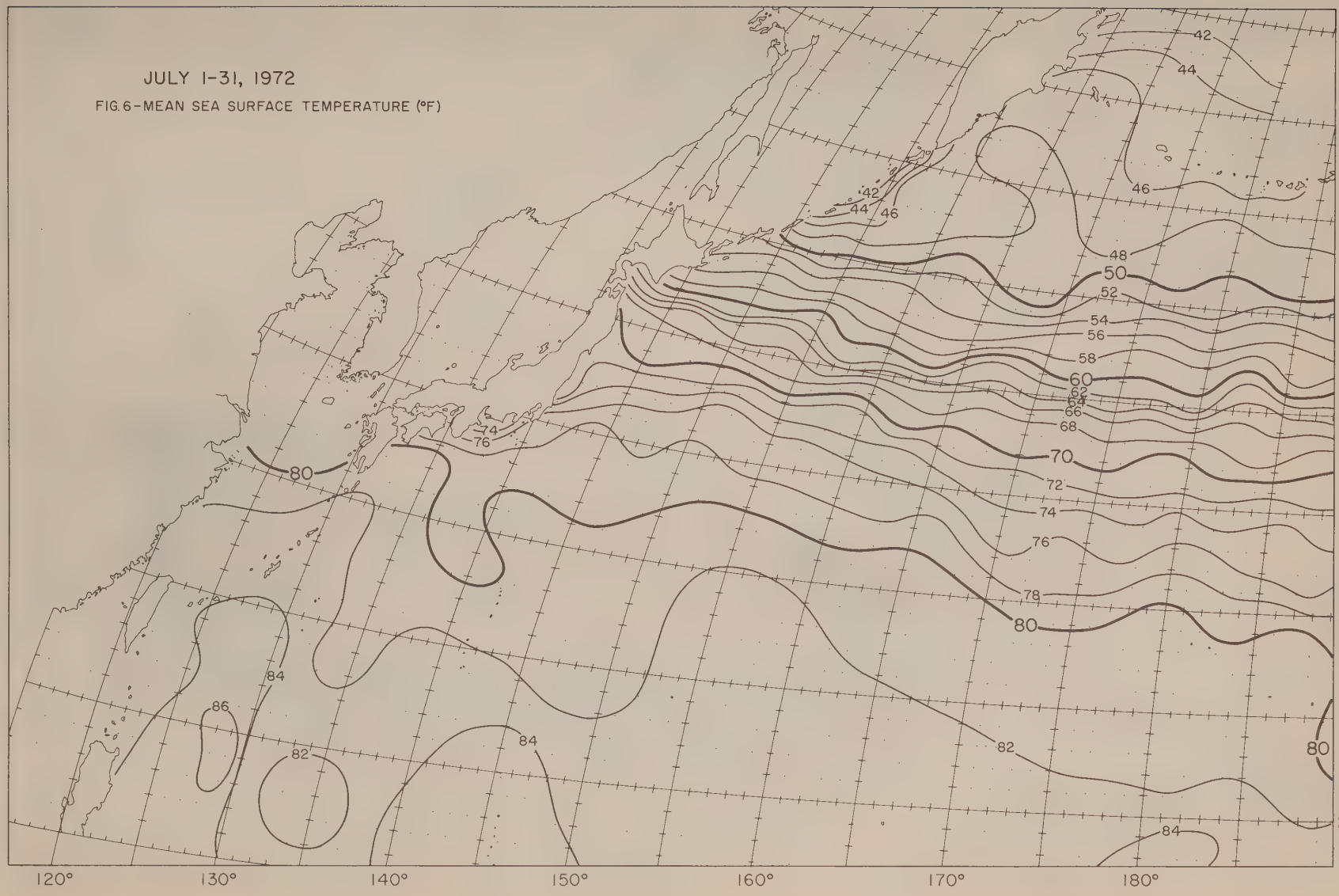
SELECTED STATION PROFILES

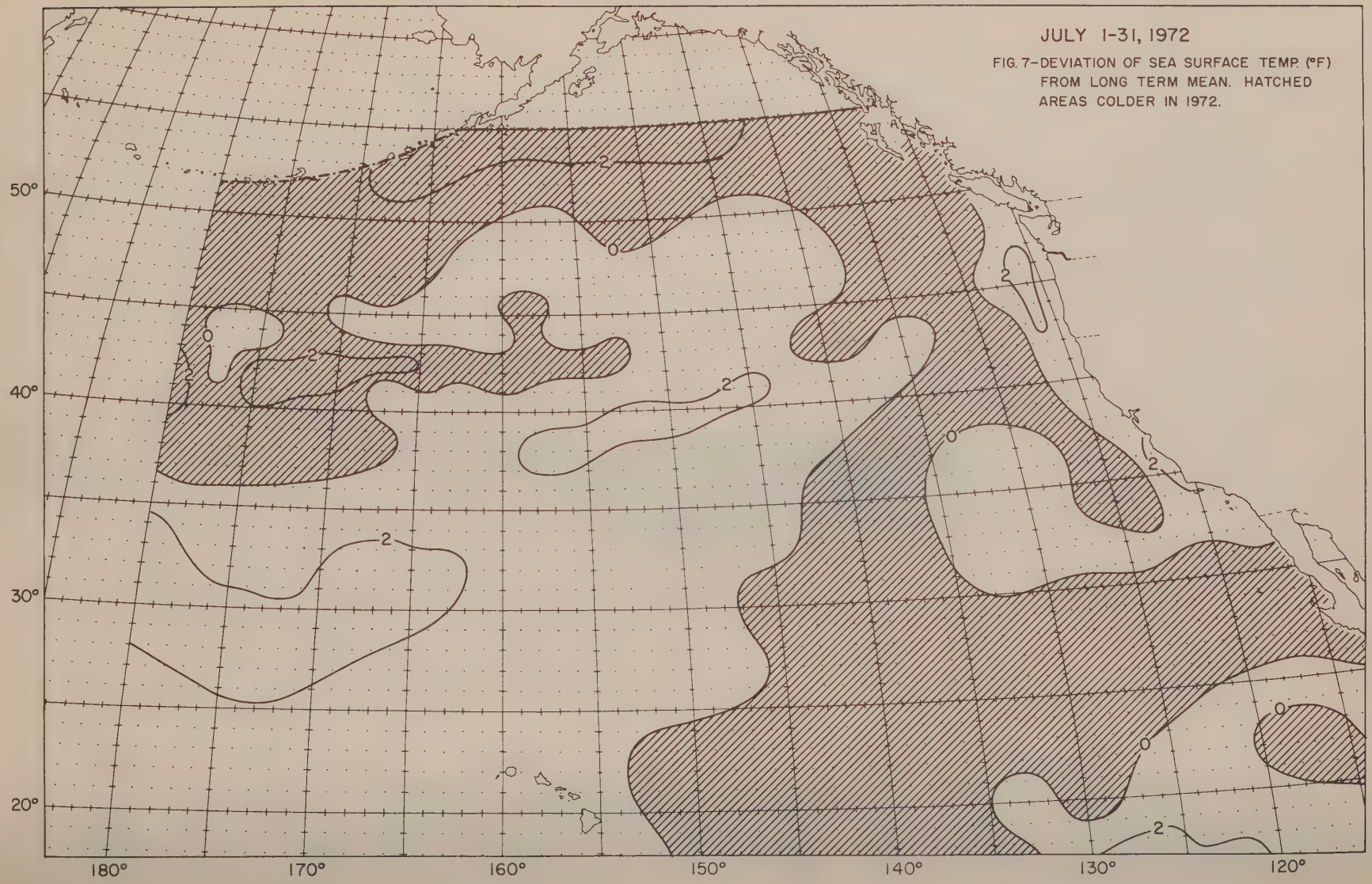


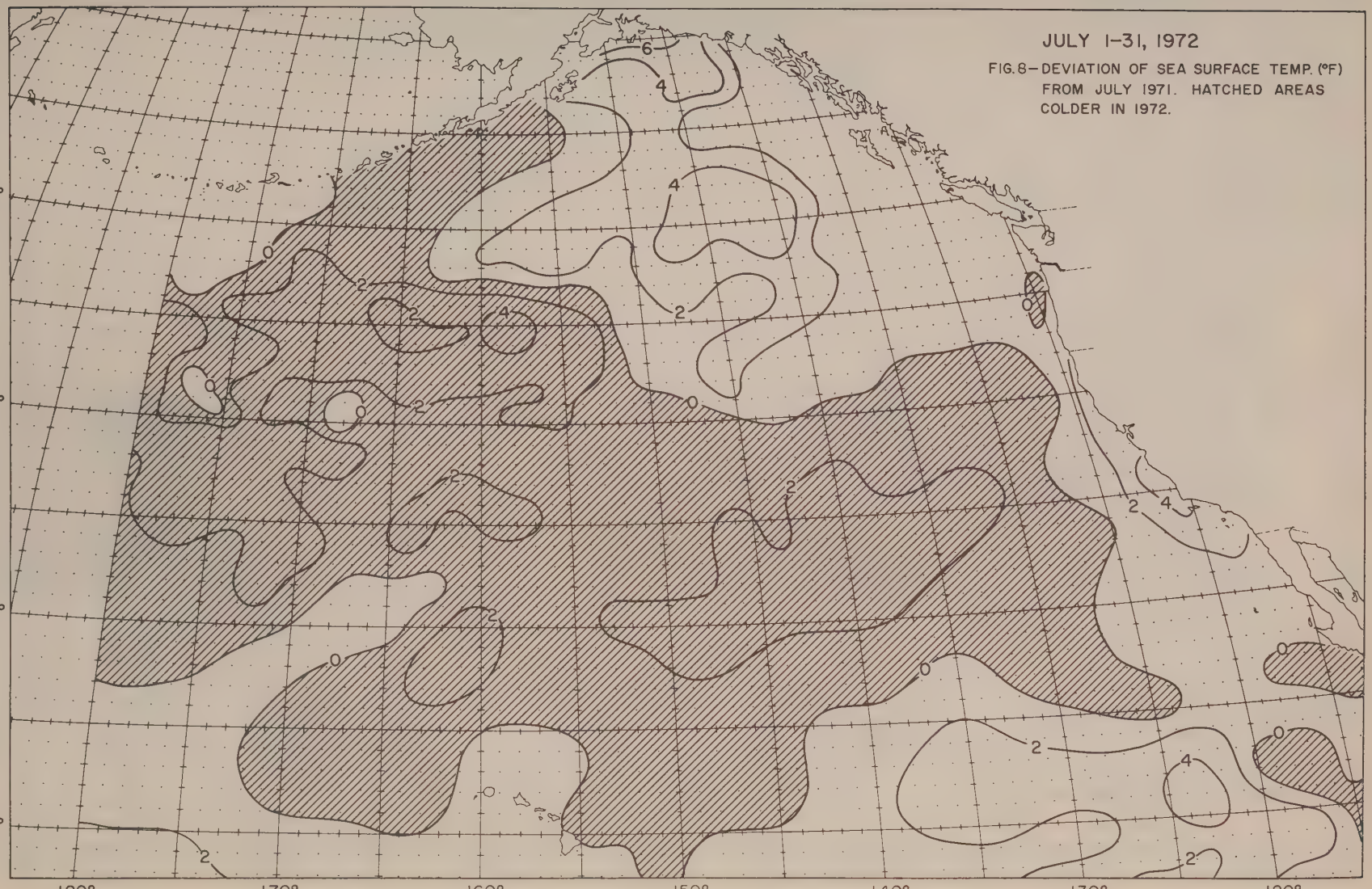

JULY 1961-1972
FIG. 3-OBSERVED MEAN VALUES
-0000- BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.).
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1016
1020
1024
1016
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.

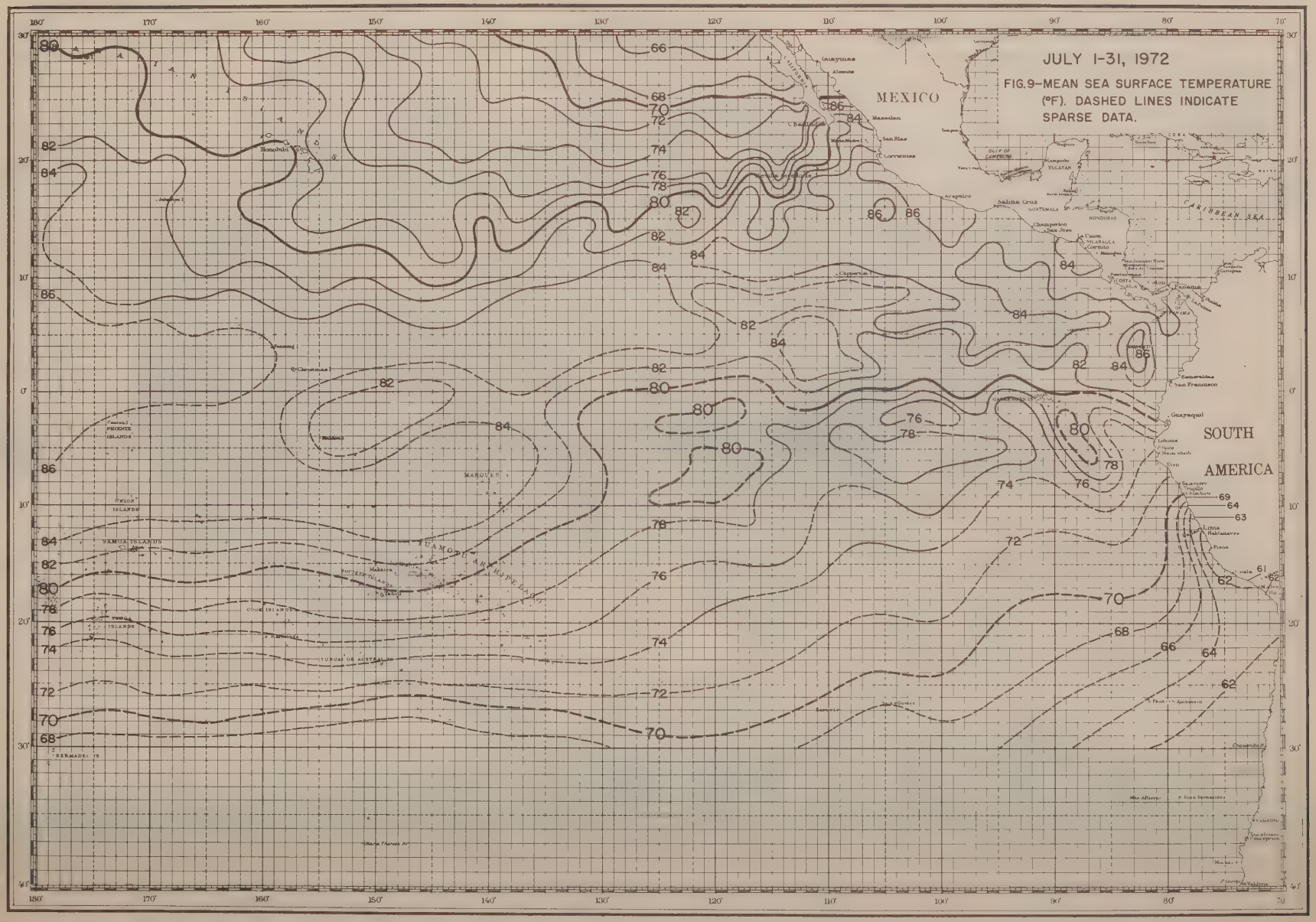

JULY 1972
FIG. 4-OBSERVED VALUES
—0000— BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.).
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1020
1024
1016
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.

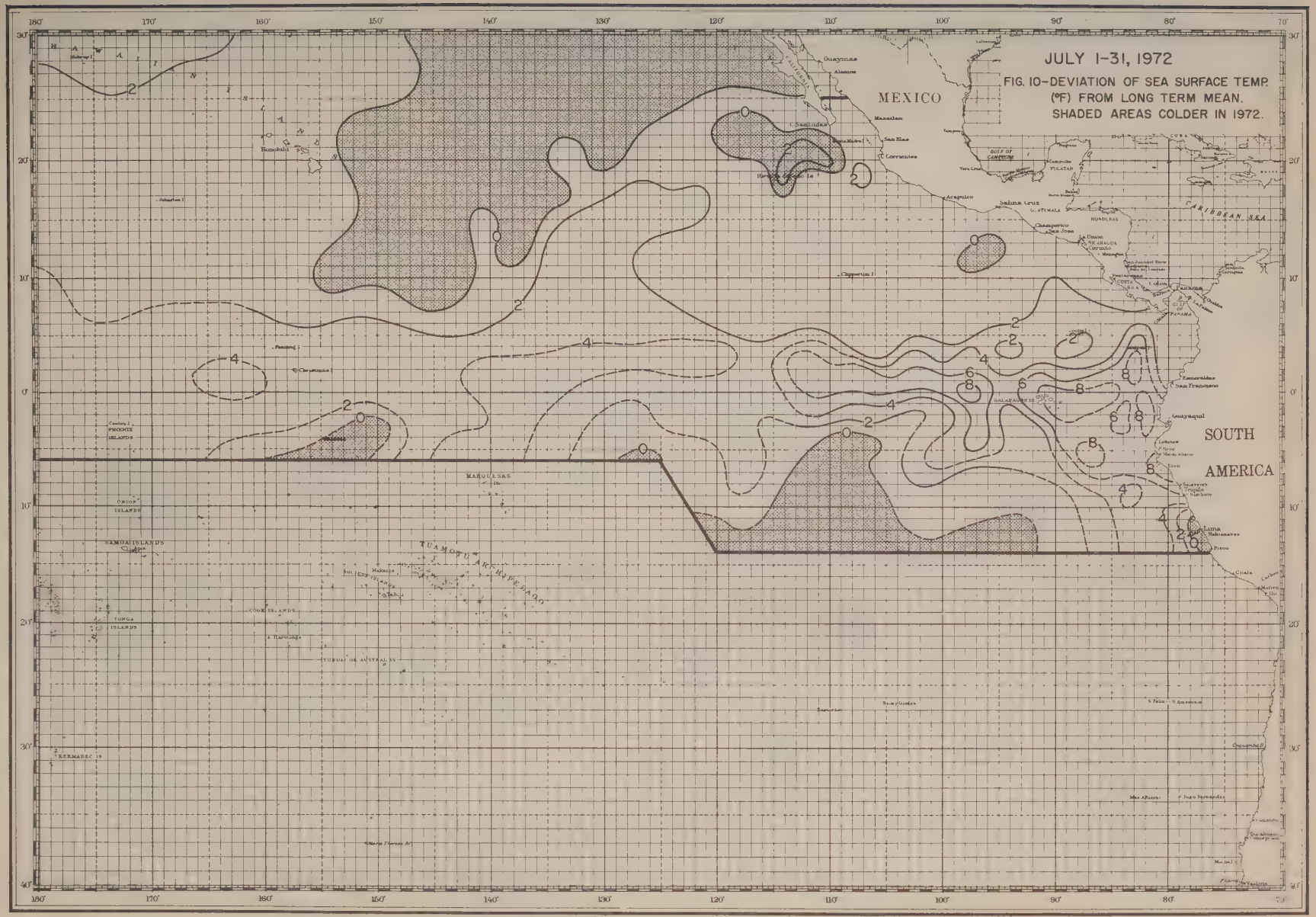

JULY 1-31, 1972
FIG. 5-MEAN SEA SURFACE TEMPERATURE (°F)
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°

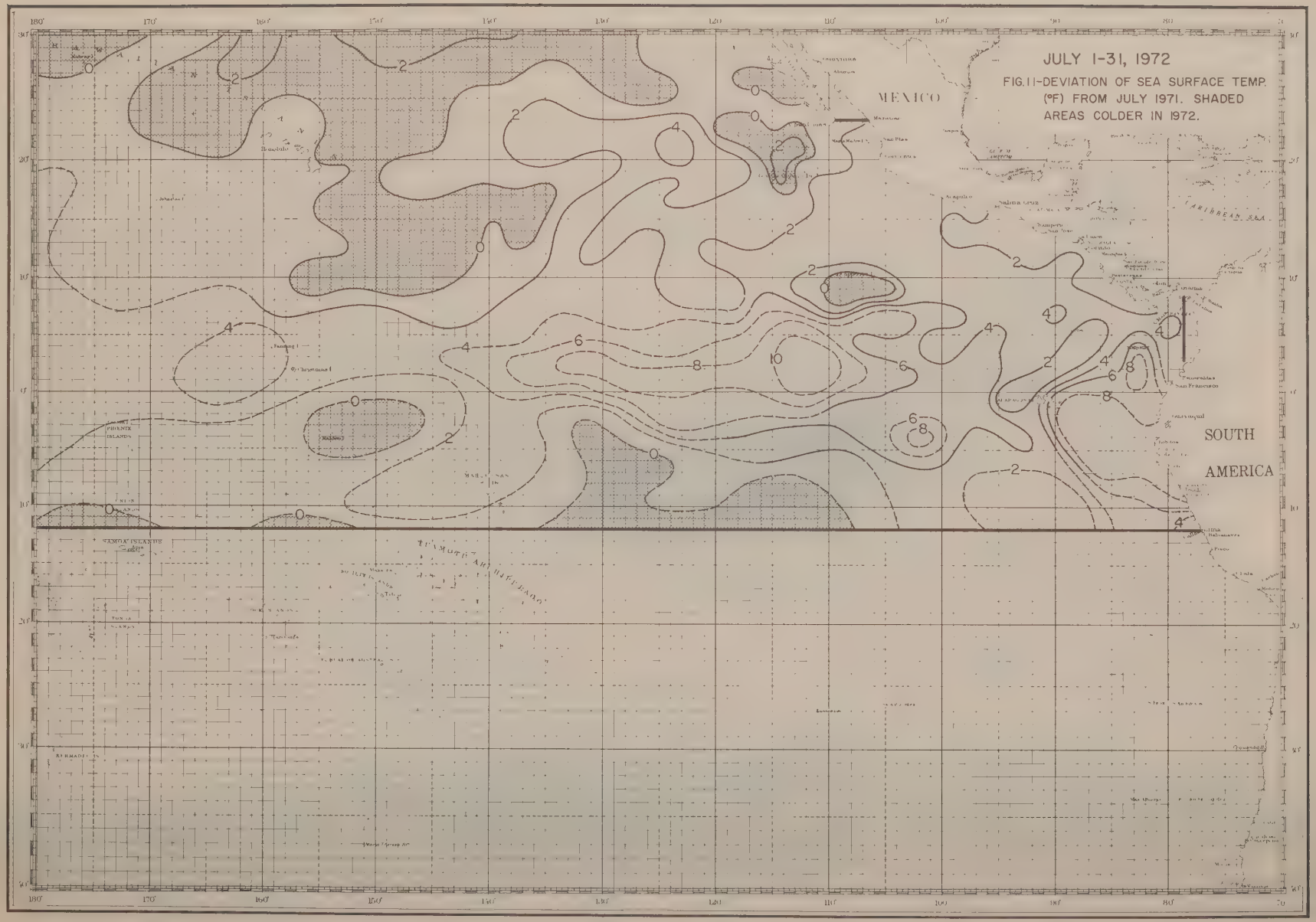

JULY 1-31, 1972
FIG.6-MEAN SEA SURFACE TEMPERATURE (°F)
60°
50°
40°
30°
20°
120°
130°
140°
150°
160°
170°
180°
42
44
46
48
50
52
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82
84
86


JULY 1-31, 1972
FIG. 7-DEVIATION OF SEA SURFACE TEMP. (°F) FROM LONG TERM MEAN. HATCHED AREAS COLDER IN 1972.
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°
0
2

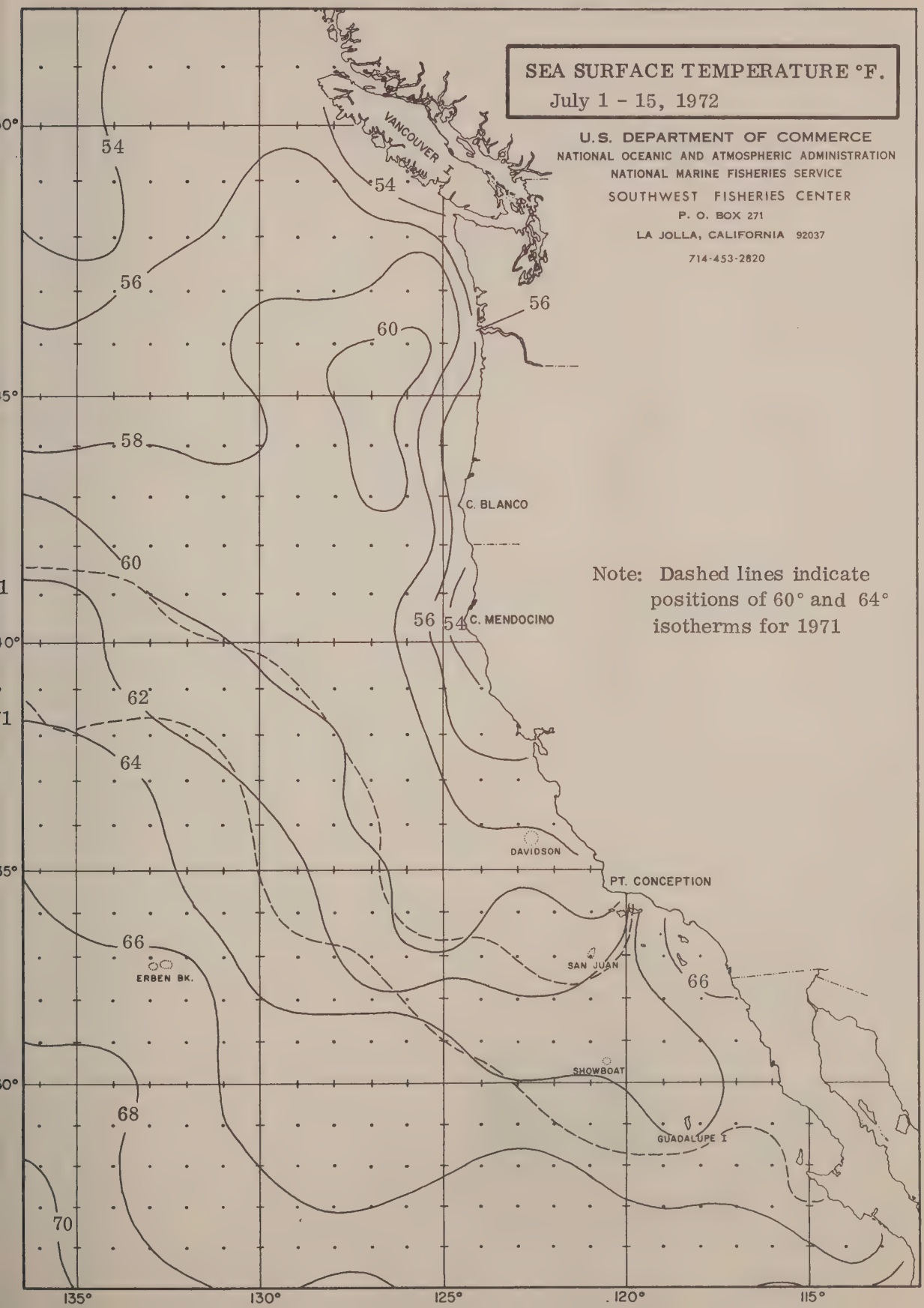

JULY 1–31, 1972
FIG. 8 – DEVIATION OF SEA SURFACE TEMP. (°F) FROM JULY 1971. HATCHED AREAS COLDER IN 1972.
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


JULY 1-31, 1972
FIG.9–MEAN SEA SURFACE TEMPERATURE (°F). DASHED LINES INDICATE SPARSE DATA.
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
HAWAIIAN ISLANDS
Honolulu
Christmas I.
MARQUESAS
SAMOA ISLANDS
COOK ISLANDS
TUAMOTU ARCHIPELAGO
TUBUAI OR AUSTRAL IS.
BERMUDA IS.
Guayaquil
Lima
Callao
Arica
Iquique
Valparaiso
Easter I.
Juan Fernandez

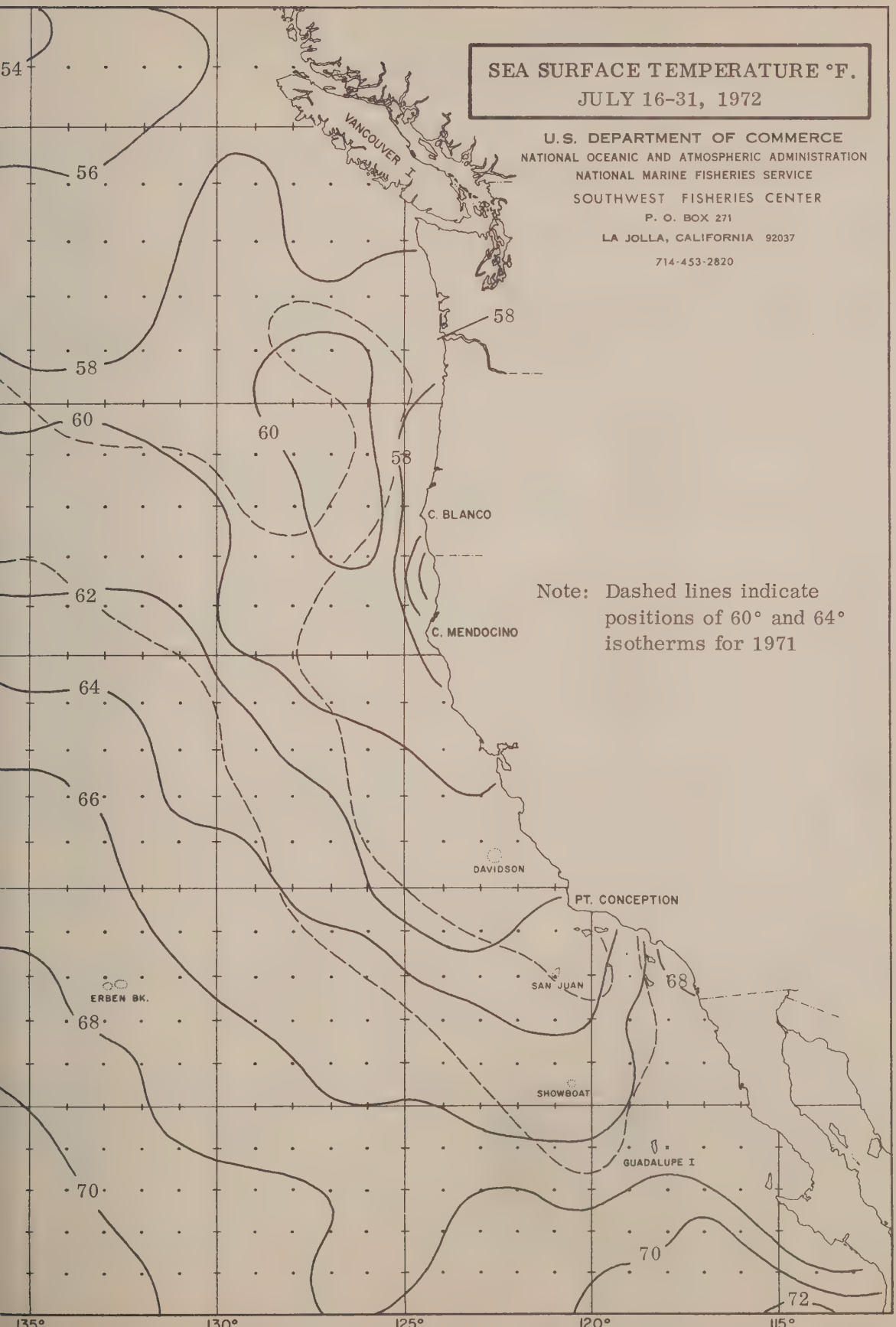

JULY 1-31, 1972
FIG. 10-DEVIATION OF SEA SURFACE TEMP. (°F) FROM LONG TERM MEAN. SHADED AREAS COLDER IN 1972.
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
GULF OF CALIFORNIA
GULF OF CAMPECHE
GALAPAGOS IS.
MARQUESAS
TUAMOTU ARCHIPELAGO
SAMOA ISLANDS
COOK IS.
TONGA ISLANDS
PHOENIX ISLANDS
ORION ISLANDS
KERMADEC IS.
Acapulco
Salina Cruz
Guayaquil
Lima
Callao
Honolulu
180°
170°
160°
150°
140°
130°
120°
110°
100°
90°
80°
70°
30°
20°
10°
0°
10°
20°
30°
40°


JULY 1-31, 1972
FIG. 11-DEVIATION OF SEA SURFACE TEMP. (°F) FROM JULY 1971. SHADED AREAS COLDER IN 1972.
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
180°
170°
160°
150°
140°
130°
120°
110°
100°
90°
80°
70°
30°
20°
10°
0°
10°
20°
30°

FISHING INFORMATION – supplement



FISHING INFORMATION – supplement



UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center
La Jolla, California 92037

BULLETIN NO. 72-2

JOINT NMFS-AFRF ALBACORE SCOUTING AND RESEARCH PROGRAM IN FULL OPERATION, EARLY ALBACORE SEASON UNDERWAY

Only a very small number of commercial boats had begun to fish for albacore by the end of the month and catches were eported to be scattered and low except outside Erben Bank.

Catches of over 100 fish per day on 25- to 30-pound fish were made outside and south of Erben Bank during the last eek of June. The body of fish in the vicinity of Erben Bank was located during the second week of June by albacore vessels charter to the American Fishermen's Research Foundation and working cooperatively with the NMFS, La Jolla Laboratory. nall numbers of fish were reported to have been caught by commercial boats during the last week of June 85 and 400 miles outhwest and west of Point Arena, near Cortez Bank, 215 miles west of San Francisco, near Davidson seamount, and 20 to 40 d 100 miles southwest of San Diego. There are reports that many commercial boats plan to start fishing just after the July 4th oliday.

The joint NMFS-AFRF albacore scouting and research program for this season reached full operation during the last weeks of June with 12 vessels chartered to AFRF fishing, making scientific observations, and tagging albacore. By morning June 29, a total of 5241 fish had been caught, of which 1023 had been tagged.

Best catches by AFRF boats were made during the third week of June, 150 to 350 miles west and northwest of Erben ank. Water temperatures were from 64° to 67°F and most of the fish were larger than 25 pounds and many less than 10 pounds, t only a few 12- to 15-pound fish.

Four of the vessels on charter to AFRF departed Astoria, Oregon on June 15, and travelled southward about 300 400 miles off the coast. They made their first catches about 400 miles west southwest of Cape Mendocino on June 21. Only small number of 12- to 15-pound fish were caught in 59°F water. At month's end these vessels were working about 300 miles est of Point Arena and toward the north. Four other boats were working southward about 180 miles off Point Conception and e expected to arrive in San Diego about July 5 to 7. Four other boats completed their charter and returned to port on June 28.

The first sport catches off San Diego were reported June 23, when fish were caught 20 miles southwest of Point Loma. high of three fish per passenger was reached on June 26 but had declined to less than one fish per passenger on June 28. atches were made on fish weighing 20 pounds or better.

Prevailing weather conditions during the June 16-29 period have decreased the rate of seasonal warming in a large ea between 35°N and 45°N and from the coast out to 136°W. As a consequence, sea surface temperatures in this region are, general, below normal, and the 60°F isotherm is displaced 2 to 3 degrees south of its 1971 position between 126°W and 136°W. rong northwesterly winds offshore southern Oregon and northern California intensified upwelling between Cape Blanco and Point ena, causing temperatures to drop below normal and increasing the horizontal temperature gradients in this region.

Offshore southern California and northern Baja California, southerly winds during part of the last 2 weeks of June lowed sea surface temperatures to warm faster than above normal from the coast out to 122°W, over the San Juan and Showboat amount areas.

According to information supplied by the Extended Forecast Division of the National Weather Service, sea level pressures e expected to remain above normal during the first 2 weeks of July. These conditions, coupled with above-normal heating over e interior regions of the Pacific Southwest, will cause the strong north-northwesterly winds off the U.S. west coast to continue. s a result, strong pulses of upwelling should occur along the Oregon and northern and central California coasts. Although these nditions are favorable for creating thermal fronts, fishing efforts may be hampered by strong winds and rough seas.

It appears that the offshore area between San Juan seamount and Davidson seamount holds the best potential for jig shing on 12- to 15-pound fish during the next 2 weeks. However, strong winds could develop in the area and make fishing fficult. Spotty, but good fishing on fish over 20 pounds and less than 10 pounds is expected in the offshore area from San Juan amount southward to at least Showboat. The area 200 to 250 miles offshore between Point Arena and Davidson seamount also lds relatively good promise. Sportfishing off southern California should improve markedly during the next 2 weeks.

Fishermen are reminded to be on the lookout for tagged albacore.

ne 29, 1972

Staff, Fishery-Oceanography Investigations
R. Michael Laurs, Leader

UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center
La Jolla, California 92037

FISHING INFORMATION
BULLETIN NO. 72-3

ALBACORE SEASON UNDERWAY

Commercial albacore fishing activities increased sharply after the July 4 holiday when many boats left port for heir first trip of the season. Catches have been reported from San Martin Island to Vancouver Island by the middle of July, owever, for the most part catches have been spotty and low. During July 4-9 boats fishing 80-100 miles offshore between Cape Mendocino and Point Arena had scores of 50-150 fish per day in 57° to 59° F water. Very good fishing was reported bout 130-150 miles off Coos Bay between July 11-15, with many catches over 300 fish per day reported on July 13. How-ver winds increased on July 15 and fishing has slackened. A couple 100 fish days were reported off the Columbia River arly in the second week of July, but fishing in this area was reported to be poor by the middle of the month.

Good fishing was reported in the vicinity of San Juan Seamount during the first part of July. But by July 10, boats noved north to the 1908 fathom spot and off Point Arguello and several scores of over 300 fish were reported on July 13. 'ishing continues to be good in this area with scores of more than 200 fish per day reported over the July 15-16 weekend n fish averaging about 18 pounds.

Other areas of fishing during the first 2 weeks of July included the 213 and 295 fathom spots off Baja California on arge 20-25 pound fish. Catches in these areas by jig boats were as high as 175 on July 12, but the albacore were reported o be running deep and sometimes hard to catch. Bait boats were also in the areas and were doing better than jig boats; owever, overall fishing in these areas has been spotty.

All 12 of the jig boats on charter to the AFRF and working cooperatively with the NMFS have completed their harter. The 12 vessels caught a total of 6,431 fish of which 1,427 were tagged.

The AFRF also chartered a San Diego bait boat which is working cooperatively with the NMFS, La Jolla Laboratory. he vessel left port on July 6 and has been working mainly near the 213 and 295 fathom spots for tagging purposes. Catches ave been on 20- 25 pound fish, but scores have generally been low. To date about 375 fish have been caught and 217 tagged.

Oregon Fish Commission (OFC) and Oregon State University (OSU) had boats scouting for albacore off Oregon uring the past 2 weeks. The OFC chartered boat left Newport, Oregon, on July 3 and worked from Cape Blanco to the olumbia River. The vessel returned to Newport early last week. The OSU research vessel Cayuse left Newport late ast week and is currently working off Oregon. Catches by both of these boats have been small.

San Diego sports boats have had spotty, but on some days very good fishing on large fish averaging over 20 pounds. harter boats have averaged about one fish per angler on most days during the past 2 weeks and over two fish on the July 5-16 weekend.

During the first 2 weeks of July, strong north-northwesterly winds along the coast between Cape Flattery and Cape lanco have caused sea surface temperatures to cool by as much as 2° F from their average values for the June 16-30 eriod. Lighter winds offshore this region have allowed temperatures to warm to 60° F and above, and consequently, strong orizontal temperature gradients now exist between Cape Flattery and Cape Mendocino. Strong northwesterly winds offshore orthern and central Baja California also caused cooling of surface waters, and temperatures that were up to 2° F above ormal during the June 16-30 period are now between 1° and 2° F below normal for the July 1-15 interval. The average osition of the 60° F isotherm is approximately the same as it was during the same period last year. However, seasonal arming of Columbia River plume water has resulted in 60° F and above water offshore between the Columbia River and ape Blanco.

The Extended Forecast Division of the National Weather Service expects sea level pressures off the U.S. west coast o remain above normal during the last 2 weeks of July. This condition, in conjunction with expected above-normal tempera-ures over the interior regions of the Pacific Southwest, will cause periods of strong north-northwesterly winds along the regon, northern and central California, and the Baja California coasts.

It appears that central California waters, notably between Point Conception and Monterey, hold the best potential or jig fishing. Scattered, and at times good fishing may also be expected off the Oregon coast, but a major center of fishing s not expected to develop there. Spotty, but good sports fishing for albacore is expected to continue off southern California.

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